Amendments to the Specification:

At page 1, before line 4, please insert the following heading and paragraph.

-- Cross-Reference to Related Application

This application is a divisional application of Application No. 10/095,014, filed March 12, 2002.

Please amend the paragraph starting at page 1, line 14 and ending at page 2, line 2 to read, as follows.

--For example, in an image forming apparatus of an electrophotographic type, a toner image is formed on a photosensitive drum (image bearing member) through image forming processes including a charging process, an exposure process and a developing process, and the toner image is transferred onto a recording material (paper, for example) from a photosensitive drum by a transfer process. In the transfer process, the toner constituting the toner image on the photosensitive drum is [[are]] not entirely transferred onto the recording material, but a small amount of the toner remains on the surface of the photosensitive drum. The toner [[was]] remaining on the surface of photosensitive drum (residual toner) is removed from the surface of photosensitive drum by the cleaning blade.--

Please amend the paragraph starting at page 2, line 8 and ending at page 2, line 9 to read, as follows.

--However, the conventional example involves the following problems.--

Please amend the paragraphs starting at page 2, line 18 and ending at page 3, line 22 to read, as follows.

--However, since the recent demand for the high-speed operation of the image forming apparatus results in an increased peripheral speed (process speed) of the photosensitive drum 11, the amount of residual toner does not decrease [[fall]] but ~~continuous becoming larger~~ increases, depending on the ambient conditions, and the residual toner may pass ~~passes~~ through the nip N formed between the edge 61a of the cleaning blade 61 and a surface of the photosensitive drum 11. The problem with this is that residual toner having passed through the nip is transferred onto the recording material (sheet material) in the next image forming process with result of stripes being produced on the resultant image.

As for a means for improving the cleaning property of the cleaning blade, Japanese Laid-open Patent Application Hei 6-4014 and Japanese Laid-open Patent Application Hei. 11-174922 propose imparting vibration to the cleaning blade using a piezoelectric element. The piezoelectric element is mounted on the cleaning blade. The cleaning blade deteriorates ~~is deteriorated~~ with use, and therefore, the piezoelectric element is replaced when the cleaning blade is replaced. This increases the cost. Additionally, it is difficult to impart such a vibration as is sufficient to remove the residual toner. A method as proposed in Japanese Laid-Open Patent Application Hei. 9-160455 in which the cleaning blade is imparted with collision vibration, may create such a vibration as is enough to remove the coagulated and grown toner. However, depending on the behavior of the cleaning blade when the collision vibration is imparted, the residual toner may pass ~~passes~~ through the nip.--

Please amend the paragraphs starting at page 4, line 4 and ending at page 4, line 23 to read, as follows.

--According to an aspect of the present invention, there is provided a cleaning device comprising a cleaning member, which is contactable to a moving image bearing member, ~~member~~ to clean a surface of the image bearing member; holding means for holding said cleaning member; and vibrating means, which is vibratable, ~~vibratable[,]~~ wherein said holding means is [[this]] movable in a direction substantially perpendicular to a surface of the ~~toward and away from said~~ image bearing member, and wherein said vibrating means is supported by [[on]] said holding means.

According to another aspect of the present invention, there is provided an image forming apparatus comprising ~~comprises~~ a movable image bearing member; image forming means for forming an image on said image bearing member; a cleaning member contacted to said image bearing member to clean a surface of said image bearing member; holding means for holding said cleaning member; and vibrating means, which is vibratable, ~~vibratable[,]~~ wherein said holding means is [[this]] movable in a direction substantially perpendicular to a surface of the ~~toward and away from said~~ image bearing member, and wherein said vibrating means is supported on said holding means.--

Please amend the heading and paragraph starting at page 5, line 4 and ending at page 5, line 7 to read, as follows.

--BRIEF DESCRIPTION OF THE DRAWINGS: ~~Figure 1 is~~

Figure 1 is a schematic longitudinal sectional view of an image forming apparatus according to an embodiment of the present invention.--

Please amend the paragraph starting at page 6, line 15 and ending at page 6, line 18 to read, as follows.

--The laser beam printer (image forming apparatus) shown in [[this]] Figure 1 comprises a printer station (image formation station) and a reader portion (image reading station).--

Please amend the paragraph starting at page 7, line 13 and ending at page 8, line 5 to read, as follows.

--In the print portion 1 of the image forming apparatus, the photosensitive drum 11 is located by a driving means (unshown) in the direction indicated by an arrow at a predetermined process speed (peripheral speed), and during the rotation, the surface of the photosensitive drum 11 is uniformly charged to a predetermined potential of a predetermined polarity by the primary charger ~~12.On~~ 12. On the other hand, in the reader portion 2, the original (unshown) pressed on the platen glass 31 by the original pressing plate 32 is eliminated at the bottom surface (image surface) by the light source 33. The light reflected by the original is reflected by the reflection mirrors 34a, 34b, 34c and is passed through the lens 35 and is incident on the CCD 36 ~~CCD36~~. The light incident on the CCD 36 ~~CCD36~~ is subjected to ~~a~~ known image processing by the image processor 37, and is converted to an electric signal 38, and is supplied to the exposure device 13 of the printer station 1 as image information to be printed.--

Please amend the paragraphs starting at page 8, line 21 and ending at page 9, line 17 to read, as follows.

--The toner image formed on the photosensitive drum 11 in this manner is then transferred ~~transfer~~ onto a recording material P. The recording material P is fed out of the sheet feeding cassette 18a or the sheet feeding cassette 18b by the sheet feeding roller 19a or the sheet feeding roller 19b, and is fed into the transfer portion formed between the photosensitive drum 11 and the transfer charger 15 with timed relation with the toner image on the photosensitive drum 11 by the registration rollers 20. The toner image on the photosensitive drum 11 is transferred onto the recording material P by application of a transfer bias to the transfer charger 15.

The recording material P, after the toner image transfer, is separated from the surface of the photosensitive drum 11 by the separation charger 16, is supplied into the fixing device 22 by the conveyer belt 21. In the fixing device 22, the recording material P is heated and pressed by the fixing roller 22a and the pressing roller 22b, by which the toner image is fixed on the surface of the recording material P. Then, the recording material P is discharged to an outside of the main assembly of the image forming apparatus by the discharging rollers 23.--

Please amend the paragraph starting at page 9, line 26 and ending at page 10, line 5 to read, as follows.

--In Figure 1, an automatic original feeding device 39 is indicated by chain lines. The automatic original feeding device 39 is disposed above the original pressing plate 32 and functions to automatically supply ~~supplies~~ the originals onto the platen glass 31 and of optically discharge the original from the platen glass 31.--

Please amend the paragraph starting at page 10, line 19 and ending at page 11, line 15 to read, as follows.

--The cleaning blade 43 is formed of an elastic plate. It is held to the frame 41, being sandwiched between the frame 41, and the holder 47 attached to the frame 41 with the use of screws 61. One of the lengthwise edges of the cleaning blade 43 is placed in contact with the peripheral surface of the photoconductive drum 11, with the cleaning blade 43 tilted so that it counters the moving direction (indicated by an arrow mark) of the peripheral surface of the photoconductive drum 11. The portion 41a of the surface of the frame 41, with which the back side of the cleaning blade 43 is placed in contact, and the portion 47a of the surface of the holder 47, with which the end surface of the cleaning blade 43 is placed in contact, have been processed with high accuracy, and have been positioned also with high accuracy. In other words, the cleaning blade 43 is held to the frame 41, with a portion of the cleaning blade 43 being placed in contact with the portion 41a of the frame 41 and the portion 47a of the holder 47, so that the cleaning blade 43 is highly accurately positioned relative to the photoconductive drum 11. The frame 41, which holds the cleaning blade 43, also holds the vibrating means 50.--

Please amend the paragraph starting at page 14, line 4 and ending at page 14, line 18 to read, as follows.

--As the edge 43a of the cleaning blade 43 in contact with the photoconductive drum 11 scrapes the peripheral surface of the photoconductive drum 11, the residual toner particles agglomerate at the edge 43a as shown in Figure ~~figure~~ 3(a). As the amount of the agglomerate residual toner particles at the edge 43a grows as shown in Figure 3(b), there

arises a possibility that a certain portion of the agglomerate residual particles will pass through the nip N between the edge 43a, and adheres to the recording medium P, ruining the image thereon. Therefore, as the residual toner particles agglomerate at the edge 43a, they must be removed before the amount of the agglomerate residual toner at the edge 43 grows large enough for the residual particles to pass through the nip N.--

Please amend the paragraph starting at page 17, line 17 and ending at page 18, line 3 to read, as follows.

--The frame 42 (housing) is for recovering the residual toner after the residual toner is removed from the peripheral surface of the photoconductive drum 11 by the cleaning blade 43. The housing 43 comprises the top portion 42a, back portion 42b, and bottom portion 42c. It has an opening, which faces the peripheral surface of the photoconductive drum 11. The top portion 42a has a pair of supporting members 56 (only one is shown in the drawing), which are located at the lengthwise ends of the top portion 42a, one for one, and project downward, supporting the shaft 48, which is disposed so that its axial line 48a is virtually parallel <u>with</u> [[to]] the generatrix of the photoconductive drum 11.--

Please amend the paragraph starting at page 20, line 2 and ending at page 20, line 24 to read, as follows.

--Referring to Figure 7, the motor unit 51, which constitutes a vibration generating means, is attached to the top surface of each lengthwise end of the bottom portion of the frame 41. Incidentally, in Figure 7, each lengthwise end portion of the case 51 is drawn with an imaginary window through which the motor 52 can be seen. The two motor units

51 are positioned so that the distance x from one motor unit 51 to the center C of the frame 41 in terms of the lengthwise direction of the frame 41 becomes the same as the distance x' from the other motor unit 51 to the center C, and also so that the output shaft 52a of each motor 52 becomes virtually parallel with [[to]] the axial line 48a of the shaft 48. In the drawing, each weight 53 is positioned on the left side of the corresponding motor 51. However, the weights 53 may be positioned so that both are on the right side of the corresponding motors 51, or one is on the right side of the corresponding motor 51, whereas the other is on the left side of the corresponding motor 51. To both motors 51, the control circuit (unshown) is connected to control the motors 51 so that the two weights 53 are rotated in the same direction.--

Please amend the paragraphs starting at page 21, line 5 and ending at page 22, line 19 to read, as follows.

--The tension spring 50 as a pressure generating elastic member is positioned between a part of the housing 42 and the spring anchoring portion of the frame 41, keeping the entirety of the frame 41, which is pivotally supported by the shaft 48, pressured in the direction to rotate counterclockwise, in the drawing, about the shaft 48. As a result, the edge 43a of the cleaning blade 43 is kept in contact with the peripheral surface of the photoconductive drum 11, generating a predetermined amount of contact pressure. Since the shaft 48 is positioned virtually in parallel with [[to]] the generatrix of the photoconductive drum 11, the contact between the peripheral surface of the photoconductive drum 11 and the edge 43a the cleaning blade 43 forms the nip N (Figure

3) between the peripheral surface of the photoconductive drum 11 and the edge 43a, which extends in the direction of the generatrix of the photoconductive drum 11.

As described above, in this embodiment, the frame 41 which is supporting the cleaning blade 43 is pivotally supported by the shaft 48 virtually in parallel with [[to]] the generatrix of the photoconductive drum 11, and also, the output shaft 52a of the motor 52 is positioned virtually in parallel with [[to]] the shaft 48. Therefore, the micro-vibrations generated by the combination of the motors 52 and weights 53 are efficiently transmitted to the edge 43a of the cleaning blade 43, micrometrically vibrating the edge 43a in the direction to cause the edge 43a to contact, or move away from, the peripheral surface of the photoconductive drum 11, in the contact nip N between the peripheral surface of the photoconductive drum 11 and the edge 43a of the cleaning blade 43. As a result, the residual toner particles are satisfactorily removed as they agglomerate at the edge 43a.

The above-described ~~above described~~ structure efficiently generates satisfactory vibrations for dislodging the agglomerate residual toner particles, making it possible to accomplish such objects as reducing the size of a vibration generation motor, reducing the power consumption, and the like.--

Please amend the paragraph starting at page 30, line 13 and ending at page 31, line 6 to read, as follows.

--The following theory is not intended to limit the scope of the present invention. But, based on the studies of the above-described ~~above described~~ experiment, the inventors of the present invention theorized that the amount by which the agglomerate residual toner particles migrate downstream onto the back side of the cleaning blade 43, in other words,

the amount of image soiling traceable to the downstream migration of the residual toner particles onto the back side of the cleaning blade 43, is dependent upon the coefficient of impact resilience of the cleaning blade 43, for the following reason. That is, the edge (free end) of a cleaning blade 43 higher in coefficient of impact resilience bounces higher from the peripheral surface of the photoconductive drum 11 than the edge of a cleaning blade 43 lower in coefficient of impact resilience. Thus, the amount by which the agglomerate residual toner particles migrate downstream onto the back side of a cleaning blade is smaller when the cleaning blade is lower in coefficient of impact resilience.--

Please amend the paragraph starting at page 32, line 12 and ending at page 32, line 17 to read, as follows.

--It had been confirmed in advance that under the above-described ~~above-described~~ condition, the residual toner particles did not agglomerate. Thus, the cleaning failure indicated in Table 2 means such a cleaning failure that occurs regardless of the agglomeration of the residual toner particles.--

Please amend the paragraph starting at page 32, line 22 and ending at page 33, line 7 to read, as follows.

--The following theory is not intended to limit the scope of the present invention. But, based on the studies of the above-described ~~above-described~~ experiment, the inventors of the present invention theorized that the cleaning performance of a cleaning apparatus is dependent upon the coefficient of impact resilience of the cleaning blade 43, for the following reason. That is, the higher the cleaning blade 43 in coefficient of impact

resilience, the superior the cleaning blade 43 in conformity to the peripheral surface of the photoconductive drum 11, and responsiveness to the micro-vibrations, in the nip N, during the rotation of the photoconductive drum 11.--

Please amend the paragraphs starting at page 33, line 26 and ending at page 34, line 24 to read, as follows.

--Incidentally, the cleaning blade 43 in this embodiment was approximately rectangular in cross section. It was 30 mm in the dimension of its free (unattached) portion in terms of the direction perpendicular to the lengthwise direction of the photoconductive drum 11, 3 mm in thickness, and 350 mm in the dimension in terms of the direction parallel with [[to]] the lengthwise direction (axial direction) of the photoconductive drum 11. Its free edge 43a was placed in contact with the peripheral surface of the photoconductive drum 11. The contact angle, or the angle of the edge 43a relative to the tangential line of the photoconductive drum 11 at the contact between the cleaning blade 43 and photoconductive drum 11, was 27 degrees, and the contact pressure was set to 13 gf/cm.

Mounting of the cleaning apparatus 17 equipped with the above-described ~~above described~~ cleaning blade 43 in an image forming apparatus in accordance with the present invention confirmed that the cleaning apparatus 17 in accordance with the present invention displayed stable cleaning performance, and that the image defects traceable to the downstream migration of the residual toner particles onto the back side of the cleaning blade 43, caused by the vibrations generated by the vibration generating means 51, did not occur.--